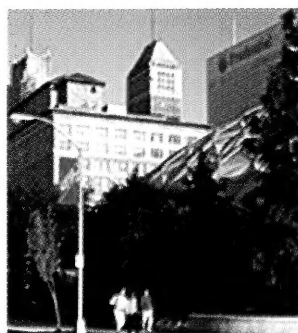
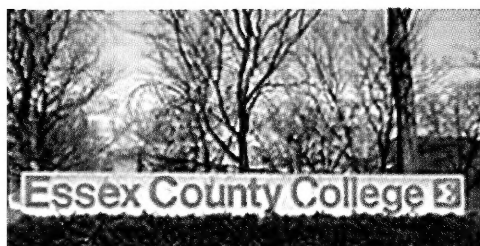


CHEN

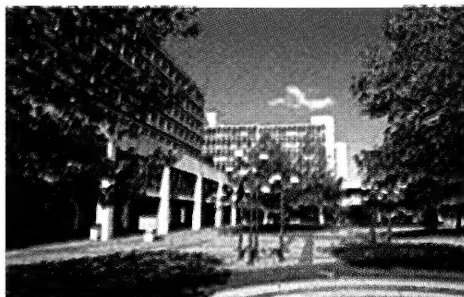
The Council for
Higher Education
in Newark
Economic Impact Report



THE STATE UNIVERSITY OF NEW JERSEY
RUTGERS
NEWARK



NJIT



July 2001

COUNCIL FOR HIGHER EDUCATION IN NEWARK

ECONOMIC IMPACT REPORT

Submitted by
The Roper Group in association with A.Ilan Consulting

July 2001

Council for Higher Education in Newark
Economic Impact Report

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THE COUNCIL FOR HIGHER EDUCATION IN NEWARK (CHEN)

The City of Newark has a long and distinguished history as a home to education in the arts, business, engineering, law, medicine, nursing and science. That tradition has flourished with the dramatic growth of the four public institutions that comprise the Council for Higher Education in Newark (CHEN). The four member institutions are:

Essex County College, a comprehensive community college located on a 22 acre Newark Campus with a West Essex Campus in Caldwell New Jersey and several satellite community programs. The College offers 41 transfer and career programs leading to Associate in Arts and Associate in Applied Science degrees as well as 21 certificates and a variety of job training and continuing education programs.

The New Jersey Institute of Technology, the State's comprehensive scientific technology research university offering programs in engineering, computer science, architecture, applied sciences, mathematics, management, policy studies and related disciplines;

Rutgers University-Newark, a part of the State University of New Jersey, and a major public research university center offering nearly 50 undergraduate programs, over 25 Master's programs including Business, Nursing, and Public Administration, a School of Law, and 13 doctoral programs.

The University of Medicine and Dentistry of New Jersey-UMDNJ, the state university of the health sciences has six schools on its Newark campus: New Jersey Dental School, New Jersey Medical School, Graduate School of Biomedical Sciences, School of Public Health, School of Health Related Professions and School of Nursing.

Through the CHEN consortium, a strong spirit of cooperation has developed among the schools while each has maintained its distinct identity and mission. CHEN faculty and administrators meet routinely to promote cooperative academic programs that increase opportunities for area students, to develop joint research projects, and to develop public service activities benefiting community needs.

We do much more, however. By generating billions of dollars in economic activity annually, CHEN brings unparalleled strength to Newark's revitalization, and to the surrounding Essex County and the entire State of New Jersey. If viewed as a business, CHEN would be a \$1.1 billion corporation with more than 11,800 employees and \$480 million in payrolls. CHEN ranks as one of the largest employers in Newark, with 9 percent of all jobs in the City. In Essex County, CHEN generates more direct jobs than the chemical, construction, apparel, printing, legal, or engineering sectors. Each day 26,000 undergraduate, graduate and professional students attend classes on the University Heights campuses of the CHEN schools.

CHEN's contributions to the City of Newark and its surrounding community extend far beyond its direct economic impact. Funds expended by CHEN spark a ripple effect

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that benefits nearly every sector of the New Jersey economy, particularly within the city of Newark and Essex County. Thousands of students graduate each year from CHEN institutions and join the area workforce as skilled workers and entrepreneurs. And CHEN sponsored programs reach far into the community to improve the lives of individuals, families and businesses in the greater Newark area.

Newark's four public institutions of higher education are proud of their role in the creation of the city's economic, intellectual, and cultural renaissance, and look forward to working with business and government to shape and transform the future.

Sincerely,



Dr. A. Zachary Yamba
President
Essex County College
Chairperson, Council for Higher
Education in Newark



Dr. Stuart D. Cook
President
University of Medicine and
Dentistry of New Jersey



Dr. Saul Fenster
President
New Jersey Institute of Technology



Dr. Norman Samuels
Provost
Rutgers, The State University of
New Jersey - Newark Campus

ACKNOWLEDGEMENTS

This study was requested and funded by CHEN (the Council for Higher Education in Newark) to evaluate the collective economic impact of the four Newark campuses on the State of New Jersey, and to describe their contributions to the local economy of Newark and its surrounding area. The report describes, in qualitative terms, the many ways in which the CHEN schools contribute to the well-being of the community.

There was a coordinating committee composed of senior university officials who provided liaison between the Roper Group and the CHEN institutions. Committee members were:

George Hampton, Vice President for Urban and Community Development, University of Medicine and Dentistry of New Jersey; Henry Mauermeyer, Senior Vice President for Administration and Treasurer, New Jersey Institute of Technology; Linda McDonald Carter, Esq., Assistant to the President and Director of Board Affairs, Essex County College; and Gene Vincenti, Associate Provost for Budget and Campus Development, Office of the Provost, Rutgers University-Newark.

There were numerous administrators and faculty members from each of the CHEN institutions who provided data for the study. A workgroup composed of CHEN staff coordinated and collected the information. Workgroup representatives from each institution were:

Essex County College: Dr. Scott Drakulich, Director for Institutional Research.

New Jersey Institute of Technology: Dr. Martha Zola, Executive Director for Institutional Planning and Research; Dr. Raymond Calluori, Information Systems Analyst; and Theodore Johnson, Executive Director of Compliance, Training & Community Relations.

Rutgers University-Newark: Heidi Szymanski, Budget and Facilities Planning Associate, Office of the Provost.

University of Medicine and Dentistry of New Jersey: David Higham, Manager for Urban Projects.

Consultants:

Richard W. Roper, President of the Roper Group prepared the study. Amos Ilan, Principal of A. Ilan Consulting, provided assistance and conducted the economic impact assessment of CHEN's spending patterns.

EXECUTIVE SUMMARY

The four higher education institutions that make up the Council for Higher Education in Newark (CHEN) are a major economic asset to the City of Newark, Essex County and the State of New Jersey. Together, Essex County College, New Jersey Institute of Technology, Rutgers University-Newark and the University of Medicine and Dentistry of New Jersey* generate billions of dollars in economic activity in New Jersey annually. Most of this impact occurs in the City of Newark and its surrounding Essex County. Moreover, CHEN plays a critical role as an active long-term partner in the economic development of its community.

CHEN has a sizable presence in Newark. Viewed as a business, CHEN would be a \$1.1 billion corporation with over 11,800 employees, over \$480 million in payrolls and more than 26,000 students. It produces thousands of graduates each year, who go on to join the workforce as productive citizens who support the economy's need for skilled workers and entrepreneurs. Ninety-four percent of all CHEN's employees are New Jersey residents. Forty percent of CHEN employees reside in Essex County with 2,057 living in Newark. As much as \$447 million of CHEN's \$481 million payroll total was paid to New Jersey residents, with Essex County residents receiving \$169 million and Newark residents receiving \$48 million.

CHEN is also a key source for renewal. Capital investment on CHEN's multi-institutional campus totaled \$409 million in the 1990s and is expected to grow another \$406 million by 2005. CHEN ranks as one of the largest employers in Newark with nine percent of all jobs in the City, as well as in Essex County, where it generates more direct jobs than the chemical, construction, apparel, printing, legal, or engineering sectors. CHEN's direct jobs are nearly comparable in number to those of the restaurant and the insurance carrier sectors. Although CHEN receives state funding, it derives most of its revenues from a variety of other sources including tuition, professional fees and research grants. Only 28 cents of every dollar spent by CHEN originated from direct appropriations provided by the State of New Jersey in Fiscal Year 2000.

When we examine CHEN's total economic impacts, we find that the \$1.1 billion in direct expenditures by the four institutions represents only a part of its many contributions. In actuality, CHEN's spending leverages even greater economic impacts on Newark, Essex County and the entire state, as funds expended for labor, materials and services spark a ripple effect that benefits nearly every sector in the New Jersey economy. This study shows that when the full multiplier effect of CHEN's spending is taken into account,

* All data and information pertaining to UMDNJ, cited either specifically or subsumed under figures reported as CHEN totals, pertain to programs, activities and spending that emanate from the schools and units that are located on the University's Newark campus only, unless otherwise noted.

CHEN exerts a strong, sustained and measurable impact on the state's economy, and particularly within Essex County and the City of Newark:

- Over \$2.6 billion dollars in total spending were generated in the State of New Jersey as a result of the initial CHEN expenditure of \$1.1 billion in Fiscal Year 2000.
- Total wages earned in New Jersey amounted to \$917 million, with \$481 million representing CHEN wages and the rest earnings by workers in various supplying industries throughout the state.
- CHEN activities generated a total of 24,558 jobs (measured in full-time equivalents -- FTE) throughout the state, of which 10,304 were at the CHEN institutions.
- The bulk of these New Jersey impacts, including multiplier effects, were generated in Essex County, with \$1.5 billion in total spending, \$537 million in wages and 12,124 jobs (FTE). The City of Newark is the focal point of these impacts.
- For each dollar in direct appropriation support by the State of New Jersey, CHEN generated \$8.47 in total spending (economic activity), including \$2.94 in wages throughout the state's economy.
- CHEN capital investments between 1990 and 2000 generated a total of \$923 million in spending and 7,843 construction-related jobs throughout the state. Investments planned for 2001-2005 are expected to generate \$918 million in spending and 7,801 jobs in New Jersey.
- Total New Jersey state taxes generated from CHEN operations in Fiscal Year 2000 are estimated at \$80.4 million.
- Total New Jersey state taxes generated from CHEN investments in an average year during the 1990's are estimated at \$2.3 million. During the 2001-2005 period the average annual figure is estimated to rise to \$4.9 million.
- For each dollar provided by the State of New Jersey in support of CHEN activities and programs, twenty-seven cents are recaptured by the State in the form of tax revenues generated each year. This is a conservative figure, not including other tax revenues from student and visitor spending.

As noted above, these substantial economic impacts capture only a part of CHEN's overall contributions. There are numerous other qualitative contributions, which are highly significant to the vitality of the City of Newark and its surrounding area. Through the years, dedicated faculty members, administrators and staff at CHEN have built strong institutions that serve the local community, the broader region, and the entire state. Their efforts have helped improve the quality of life in the community and promoted economic growth and development:

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- The presence of a dynamic academic complex with a multiplicity of reputable and highly accredited educational and research programs in the heart of Newark is a major economic asset to the City and helps to elevate its perception as a business location and attract investments.
- Tens of millions of dollars in research grants are awarded to CHEN institutions each year. The research efforts are diverse, with many of the research initiatives involving issues of great concern to New Jersey.
- CHEN members provide a huge array of direct services to the benefit of their community and the State. These include job training, student preparation, employment services, family support programs, homecare education, safety education, senior education programs, continuing education, policy studies and use of school facilities by community groups.
- Primarily through UMDNJ programs, the Newark area community benefits from an enormous variety of healthcare services. These include medical services, dental services, behavioral health programs, health education programs, crisis intervention, health screening and support for individuals with disabilities.
- CHEN institutions both individually and jointly, have developed and introduced new degree programs in response to perceived need and student demand. These new programs are in a wide range of areas including health, business, urban affairs, international affairs and science. In addition, significant curricular changes have been taking place across the board in existing programs to reflect changing needs and new technologies.
- CHEN schools are heavily engaged in outreach programs designed to reach their base community and increase the number of minority applicants in the area. A wide range of pre-college activities involve all segments of the Newark school system, such as academic support services to students and faculty to increase retention and graduation rates, strengthening student academic and study skills, SAT preparation and teacher training at feeder schools.
- CHEN schools are highly proactive in reaching diversity goals for their students, faculty and staff. One of the CHEN schools ranks as having the most diverse student population among national universities. The majority of the CHEN students are from ethnic minority groups.
- CHEN institutions are heavy supporters of local banks and other financial institutions, utilizing their services for all types of transactions. Such transactions and investments are valued in the hundreds of millions of dollars and help expand the credit base available in New Jersey.
- Hands-on assistance is provided by CHEN organizations to small businesses and entrepreneurs in the local area. This includes start-up advice, provision of real estate space, financial advice, business loans facilitation, technical assistance, government procurement assistance and other support programs. Major

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initiatives, such as the launching of the University Heights Science Park, that involves both local business development and new business attraction, reflect a major commitment by CHEN.

- Through a variety of development efforts and joint studies, CHEN assists local and state government in the advancement of constructive policies and programs involving such areas as regional transportation, telecommunications, high-tech industries, manufacturing, culture and housing.
- CHEN graduates are leaders of government and industry. They are teachers, nurses, scientists, doctors, business leaders, engineers and judges. Many are living and working in the Newark area and elsewhere in the state, making valuable contributions and filling critical labor force needs in the area. Skills acquired by graduates of the CHEN schools translate to higher earnings and a larger impact on the regional and state economy.

CHEN's contributions are particularly significant in light of the prolonged economic setbacks suffered by Newark. After decades of economic decline and disinvestment, the City of Newark is gradually gaining economic strength with declining unemployment and a growing commercial real estate sector. In this context, CHEN constitutes an important anchor in the City's infrastructure with both its education and healthcare components identified as key sectors in Newark's future growth.

CHEN's institutional presence and reputation, as well as the presence of its highly qualified alumni, play an important role in helping Newark and Essex County attract new investments and businesses. CHEN has demonstrated commitment to continued excellence and, in partnership with Newark, Essex County and the State of New Jersey, stands ready to meet the challenges and opportunities of the 21st Century.

INTRODUCTION

The four academic institutions that make up the Council for Higher Education in Newark (CHEN) are important assets to the City of Newark, Essex County and the State of New Jersey. Located in the University Heights section in central Newark, the schools -- Essex County College, New Jersey Institute of Technology, Rutgers University-Newark and the University Medicine and Dentistry of New Jersey-- boast a student body of 26,265 and a total work force of 11,870. Together, CHEN schools have a major effect on economic activity and the generation of jobs, income and taxes in the Newark area and throughout the state. Furthermore, the schools constitute a major force for economic development in the City through the many programs they dedicate to the local community.

This report identifies and quantifies the economic impacts of CHEN on the State of New Jersey and describes its contributions to the local economy of Newark and its surrounding area. The analysis shows not only the direct effects of spending, employment, wages and taxes, but also quantifies the indirect and induced effects of the direct spending as it circulates through the local and state economy. This multiplier effect, stemming from the initial spending of the academic institutions, benefits residents by creating jobs in many other sectors of the economy. Institutional spending includes annual recurring impacts as measured in terms of activity levels for Fiscal Year (FY) 2000. It also includes capital investments by the institutions for structures and equipment added in the decade of the 1990s and those expected in the next five years.

The report also describes, in qualitative terms, the many ways in which the CHEN schools contribute to the well being of the community and its economic development. These contributions include numerous programs, projects and support activities sponsored by the schools for the betterment of individuals, families and businesses within the community, which go well beyond the basic mission of providing a broad-based education. For example, CHEN supports students in need, provides diverse health services to the community, trains, retrain and develops local labor, makes purchases from local businesses, supports the transfer of technology, supports community based organizations and helps develop future leaders. Moreover, the schools strengthen the City's economic base by enhancing the perception of Newark as a business location and destination.

The economic development role of CHEN schools is particularly significant in light of the many economic challenges and needs facing the City of Newark. The major economic decline and private-sector disinvestments, which took place in Newark over a period of several decades, have devastated the vitality of the City. The economic decline is underscored by job losses in all major industries, particularly in manufacturing, as well as by the double-digit unemployment rates sustained over many years. It is also reflected in Newark's large population losses, with Census figures showing a population decline from 405 thousand in 1960 to 273 thousand in 2000. Only in recent years has Newark registered meaningful gains that hold the promise for economic renewal. Unemployment rates were cut in half between 1992 and 2000 as resident employment started to rise slowly. At the same time, population losses have

leveled off and demand for downtown office space is growing rapidly. Private investment is cautiously coming back too, but the City of Newark continues to require large, sustained investments and remains vulnerable to economic cycles in its surrounding metropolitan region and the State of New Jersey.

In this regard, the recently released *Final Report* of the Newark in the 21st Century Task Force, a blue-ribbon civic group that examined Newark's current position and future prospects, identified higher education institutions and the health complex as two of five economic clusters whose continued growth will be critical to Newark's future development. CHEN is a central component of both clusters. The growth and vitality of the CHEN institutions will help Newark's economic prospects not only through its spending and job impacts, but also through its many services and programs aimed at community development and the training and education of the local workforce to meet the City's future needs. These benefits register strongly at the county and state levels as well.

All institutional expenditure and activity data for the study were obtained directly from the CHEN organizations. Quantitative data for the four schools were consolidated throughout the analysis to present an overall profile and economic impact results. Multiplier analysis is based on the RIMS II economic model obtained from the U.S. Bureau of Economic Analysis for the State of New Jersey and Essex County. Fiscal impact analysis is based on effective overall New Jersey tax rates that relate actual tax collections to wages.

CHEN and its Community

CHEN, the Council for Higher Education in Newark, is a consortium of four public higher education institutions located in the University Heights district just west of the central business district in downtown Newark. The University Heights community experienced a severe economic decline during the 1960s and 1970, creating an enormous need for reinvestment and broad-based economic development support. CHEN was established during this period to foster cooperative academic programming among its member schools, and to concentrate institutional resources on the key problems facing the community and improve the quality of life of its population.

Critical Mass

With 11,870 employees, CHEN brings under one umbrella four institutions that make up one of the largest organizations in New Jersey. Within Essex County, CHEN ranks in the very top group of employers, accounting for 3.2% of Essex County jobs and 9.0% of Newark's jobs. CHEN institutions directly employ more people in Essex County than the chemical, construction, apparel, printing, legal, or engineering sectors, and nearly as many as the restaurant and the insurance carrier sectors.

Each of the four institutions is unique in its mission, resources and capabilities. Through their diverse capabilities and the combined strength of their faculty and staff, CHEN has played an important role in the development of its community for over two

decades. In particular, the close proximity of the institutions to one another creates a synergy within the area, which increases the number of possible ways resources may be combined to tackle local needs. CHEN members are committed to their role as urban institutions. They support their local community not only as educators, but also through numerous other programs and activities that contribute, individually and collectively, to the development and growth of the local economy and the well being of its residents.

CHEN Joint Collaborations

New collaborations are discussed at monthly meetings of CHEN, attended by the presidents of Essex County College, NJIT, and UMDNJ and the provost of Rutgers-Newark. In addition, CHEN faculty members and administrators meet regularly to plan and coordinate joint programs and to share mutual concerns and opportunities. Cooperative initiatives extend across all four institutions. They include joint academic degrees, research programs and grant development initiatives, and academic conferences and seminars. Together, this higher education community brings complimentary strengths to joint programs in the biological sciences and bioengineering, computer and information sciences, private and public management, the health related professions, application-oriented sciences such as chemistry, physics, mathematics and the environmental and social sciences.

Graduate students enrolled at one of the senior institutions (UMDNJ, NJIT, RU) are able to take courses and utilize the research facilities at the other campuses. Together, these institutions offer more than a dozen collaborative graduate degree programs, placing them as leaders in the development of programs to prepare individuals for a world increasingly cross-disciplinary and technological in nature. Other CHEN collaborations focus on community outreach initiatives, public service activities and cultural events.

The high level of collaborative activity has positioned Newark as one of the nation's largest academic communities and led to impressive developments in recent years. Included among these developments are:

- *The Graduate Center at Newark*, a joint venture of Rutgers-Newark, the New Jersey Institute of Technology, and the University of Medicine and Dentistry of New Jersey. Seen as the next logical step in coordinating graduate education in Newark, the purpose of The Graduate Center is to further the quality of graduate education and research and to attract more high-level graduate students and postdoctoral fellows to the city.
- *University Heights Science Park (UHSP)*, a joint venture of Rutgers-Newark, New Jersey Institute of Technology, the University of Medicine and Dentistry of New Jersey, Essex County College, and private industry to convert university research into commercial uses. UHSP was launched in 1992 as a mixed-use science and technology park on a 50-acre site adjacent to the four sponsoring schools. With some of its facilities already in place, the Science Park will ultimately include one million square feet of research, technology, business incubation and office space.

The Park's development will also incorporate ancillary support retail space, a technology high school, housing units and a day care center.

- Construction activity in the Science Park completed or underway totals 235,000 square feet. Two Science Park buildings were completed in 1996: the 15,000 square foot CHEN building and the 30,000 square foot NJIT business incubator. The former houses the administrative office of the UHSP, Inc. and two concept laboratories: the Medical Device Concept Laboratory of the New Jersey Center for Biomaterials and Medical Devices; and the Laboratory for Drug Delivery. The business incubator is home to the NJIT Enterprise Development Center II that provides space for technology start-up companies. Science Park also includes a completed, fully operational 100 child day care center that serves the community. Construction has begun on the first phase of housing, *Science Park Village*, of 21 units of one and two family homes.

Construction has begun also on the International Center for Public Health at Science Park. This 190,000 square foot, \$78 million project will be headquarters of the Public Health Research Institute (PHRI), an organization that conducts research with a focus on infectious diseases and public health. The PHRI is relocating from Manhattan to the International Center to work closely with the research programs of the CHEN universities. Located within the International Center along with the PHRI will be the NJMS National Tuberculosis Center at UMDNJ, the NJMS Department of Microbiology and Molecular Genetics, and the Newark Public Health Program. When completed, the ICPH will bring together a focused team of scientists and clinicians dedicated to understanding and solving cutting edge problems in infectious disease, microbial antibiotic resistance and public health.

- *University Heights Development Program.* Among the most noted collaborative efforts of the CHEN schools is the creation of the University Heights Development Program in 1986, which formed a coalition of community, educational, political and business leaders around a consensus plan for the revitalization of the University Heights neighborhood which hosts the University's campuses. In recent years improvements have included a major focus on new housing, both affordable and market rate. In the area of retail and services, several new developments including a movie theater and several shopping malls have been completed since 1986 that reflect the spirit of the consensus development plan. In 1997 the city of Newark designated the University Heights/Science Park District as one of the city's "Engines of Growth", viewing it as an area that continues to be ready for redevelopment of housing, science and technology business, new employment opportunities, retail, services and amenities.
- *Collaborations with Newark school students.* The CHEN institutions sponsor numerous academic enrichment programs designed to involve all segments of the Newark school system. These programs, which are described in more detail later in this report, provide several thousand area young people and their teachers each year with supplemental academic instruction, cultural programs and technical assistance. An example is the The Faculty Alliance for Education, a collaboration of

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faculty from Essex County College, Rutgers-Newark, NJIT and Malcolm X Shabazz and Central High Schools that seeks to improve the quality of education in Newark by working to create a "seamless curriculum" from grades K through 12. This initiative seeks to ensure student preparedness for the demands of higher education.

As part of the University Heights Science Park project, the CHEN schools are developing a Science Park High School in conjunction with the Newark School District to educate young people from Newark and adjacent areas for careers in the technologies.

While much progress has been made in recent years in advancing the economic objectives of the City of Newark, the City's economic development needs remain great and continue to require the commitment of the CHEN institutions. Each school plays a unique role within CHEN:

Essex County College



Essex County College (ECC) was established in 1966 as the community college of the County of Essex, began operating as a two-year college two years later in downtown Newark. In 1970, the College purchased a 22-acre site from the Newark Housing Authority for its permanent campus and, in 1976, moved to its current location in the heart of the University Heights district. Today, ECC's main Newark campus includes a three-block long megastructure and gymnasium/child care center complex. Two new structures recently completed are the Center for Technology (1996) and the Student Center that was completed in 1999. Essex County College is a comprehensive community college committed to providing quality programs and services that are accessible, adaptable and affordable. As an open- admissions institution, it offers a learning environment that enables students with a wide variety of backgrounds to develop their abilities and enrich their personal and professional lives.

The college offers three types of associate degree programs as well as numerous continuing education courses designed to enhance the professional, personal, cultural and vocational needs and interests of the community. Custom designed programs are also offered to meet the specific training needs of firms and organizations. The college provides a range of support services that include remedial instruction, counseling, tutoring, child care services and special programs for veterans, senior citizens, minorities and women. Since 1968, the College has awarded associate degrees to more than 10,000 graduates. Thousands of others have developed their skills at ECC before transferring to four-year institutions or rejoining the labor force.

New Jersey Institute of Technology



New Jersey Institute of Technology (NJIT) is the State's comprehensive scientific technological research university located on a 45-acre campus in the University Heights neighborhood. Established in 1881, the university's mission is to expand knowledge through research and scholarly activities with a strong application

orientation. The university has six colleges: Newark College of Engineering, the New Jersey School of Architecture, the College of Science and Liberal Arts, the College of Computing Sciences, the School of Management, and the Albert Dorman Honors College. Approximately one-third of its students are graduate students. NJIT offers a comprehensive array of programs in engineering and engineering technology, computer science, architecture, applied sciences, mathematics, management, policy studies, and related disciplines throughout New Jersey and the nation.

As a public, urban research university, NJIT is committed to the pursuit of excellence in undergraduate, graduate, and continuing professional education, preparing students for productive careers and amplifying their potential for lifelong personal and professional growth. NJIT conducts research in such multi-disciplinary fields as environmental preservation, sustainability, information technology and communications, materials science and engineering, solar astrophysics, transportation, microelectronics, architecture and building sciences, manufacturing, productivity enhancement, infrastructure systems, communications technologies and biotechnologies. The school contributes to the State's economic development through partnerships and joint ventures with the business community and through the development of intellectual property. NJIT serves both its local communities and the broader society by conducting public policy studies, making educational opportunities widely available, and initiating community-building projects.

NJIT prepares its graduates for positions of leadership as professionals and as citizens; provides educational opportunities for a broadly diverse student body; responds to needs of large and small businesses, state and local governmental agencies, and civic organizations; and advances the uses of technology as a means of improving the quality of life.



Rutgers University – Newark, a part of the State University of New Jersey, is a major public university center committed to excellence in teaching, research, and service to the community. The campus, occupying 30 buildings on 35 acres in downtown Newark, offers nearly 50 undergraduate programs, over 25 Master's programs and 13 doctoral programs. There are two undergraduate liberal arts colleges on the Newark campus - the Newark College of Arts and Sciences and University College - Newark. In addition, there are six other colleges - the College of Nursing, the Graduate School - Newark, the School of Law - Newark, the School of Criminal Justice, the School of Management and the Graduate School of Management. Rutgers - Newark is the home of three major research centers of graduate study: the Center for Molecular and Behavioral Neuroscience, the Center for Global Change and Governance, and the Joseph Cornwall Center for Metropolitan Studies.

The mission of the undergraduate programs is to equip students with knowledge and skills necessary to participate fully in the economic, scientific, cultural, and political life of the community and the nation. Graduate and professional schools at Rutgers prepare students for leadership in scientific, commercial, legal, social, and health care arenas. Major research foci in the sciences include neuroscience, chemical biology, cell

biology, and materials science. Major research foci in the social sciences include public administration, metropolitan studies, trends in globalization, and studies of ethnicity. The campus's professional schools conduct research programs with significant practical impact in business / management, law, criminal justice and nursing. Campus goals and opportunities are strongly influenced by location in the midst of New Jersey's largest city. Rutgers historically has provided a quality education firmly rooted in the arts and sciences, as well as programs of study appropriate for entry into professions.

Rutgers offers a variety of innovative programs designed to make the most effective use of resources, including accelerated programs, continuing education, joint programs with other institutions, interdisciplinary programs, and programs that integrate public service with regular coursework.



The University of Medicine and Dentistry of New Jersey (UMDNJ)

UMDNJ is the State's public university of the health sciences, encompassing a statewide system of health sciences education, biomedical research, patient care and community service. Founded in 1970 to consolidate New Jersey's health professions education, UMDNJ has eight schools on five campuses and a statewide network of more than 200 educational and healthcare affiliates.

The University is dedicated to the education of physicians, dentists, scientists, nurses and other healthcare professionals; the conduct of biomedical research, patient care and community service. With more than 4,000 students enrolled in its programs statewide, and more than 1,000 medical interns and residents, UMDNJ is the sole entity responsible for statewide undergraduate medical and dental education, and the largest sponsor of graduate medical and other health professions education. UMDNJ is also New Jersey's primary source of continuing and advanced education for health professionals.

Ideas born in UMDNJ's laboratories are translated into improved medications, new diagnostic and treatment techniques and innovative medical equipment in healthcare programs throughout the country. For New Jersey, UMDNJ serves as a resource for, and a link among, academic scientists working at the state's colleges and universities, practicing physicians at community hospitals, and research and development experts in pharmaceutical and other health-related industries. Since the University's mission is to improve the health of New Jersey, research programs focus on the state's most urgent health problems.

The University also serves at the core of a unique, statewide system designed to provide all New Jerseyans with access to a full range of high quality healthcare services. Services encompass both state-of-the-art specialized treatment programs offered regionally on a referral basis, and primary care and prevention programs for the state's neediest citizens. In addition, outreach programs utilizing community-based clinics

and mobile HealthCare teams offer care to medically underserved citizens in urban and rural areas throughout the state.

In Newark six of UMDNJ's eight schools and several health care facilities are located on a 64-acre campus in the University Heights section of the city. The six schools on the Newark campus include the New Jersey Medical School (NJMS), the New Jersey Dental School (NJDS), the School of Nursing (SN), the Graduate School of Biomedical Sciences (GSBS), the School of Health Related Professions (SHRP), and the School of Public Health (SPH). The health care facilities are: UMDNJ-University Hospital – the core teaching facility of the New Jersey Medical School and the center for referral for many of the state's most advanced medical services and specialty care programs; the Doctors Office Center – a major medical/dental office complex providing outpatient care with university-level expertise; and the University Behavioral HealthCare – a program providing advanced treatment for mental health problems. Programs located on the Newark campus offer literally hundreds of outreach and clinical care services that are designed to address the comprehensive health care needs of residents of the greater Newark area.

In December 1999 the UMDNJ Board of Trustees approved a University-wide capital construction plan, with \$192 million targeted for many exciting projects on the Newark campus. New construction and facility upgrades planned for the Newark campus include a new University Behavioral HealthCare building, expansion of cancer research and treatment facilities, additional research and educational space, and upgrades to University Hospital and Doctors Office Center program areas, among other projects.

DIRECT IMPACTS

The CHEN schools are intricately involved in the economic life of the City of Newark through their day-to-day financial expenditures and long-term investments. By channeling new spending streams throughout the region and the state, CHEN schools and their employees affect the lives of nearly all City residents as well as the economy of Essex County and the State of New Jersey. They do so as employers, investors, wage earners, taxpayers and buyers of materials and services from local vendors. The direct effects of the CHEN schools in FY 2000 are extensive:

Spending

The direct spending by CHEN institutions on all their diverse requirements for labor, goods and services represents the first round of economic impacts in the analysis. These direct impacts give rise to the multiplier effect that boosts the overall effects in various sectors of the economy, both locally and statewide. During fiscal year 2000, the CHEN schools directly spent a total of \$1,104,524,000, with the vast majority of the spending going to in-state workers and vendors. The following table details the major categories of direct CHEN spending:

Table 1: CHEN Direct Spending in Fiscal Year 2000 (in \$1,000s)

EXPENDITURE CATEGORY	AMOUNT in \$1,000s
Instruction	\$199,473
Research	75,345
Public service	7,349
Academic Support	18,946
Student Services	14,216
Scholarships	98,796
Institutional Support	26,701
Physical Plant	52,800
Debt Service & Transfers	25,224
Prof/Admin Services & Other	285,615
Medical Services	300,059
Total	\$1,104,524

Source: CHEN

Although this quantitative part of the analysis focuses on the totality of CHEN's expenditure streams, it is important to keep in mind that these expenditures reflect the operations of hundreds of programs and institutional activities. They range from the teaching of the sciences, humanities, business, engineering and management, to the training of physicians and the provision of healthcare services. They capture dozens of outreach programs to the community as well as cutting edge research that benefits the entire state. The core of many of these programs was described in the Introduction, with more details on specific programs provided later in the report.

Looking across all CHEN programs and institutions, the main categories of spending for which consistent data were available are as follows:

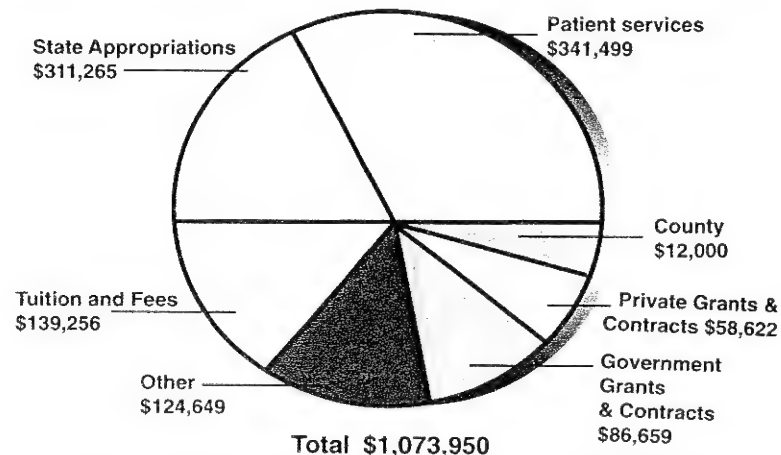
- Medical Services totaled \$300 million.
- Professional/Administrative services, and other expenses amounted to \$286 million.
- Spending for Instruction and Research accounted for \$275 million of this total.
- Spending for Scholarships, Academic Support and Student Services were \$132 million.
- Spending for physical plant totaled \$ 53 million.
- Institutional Support totaled \$27 million.

These direct spending streams, with additional information on payrolls and purchases, served as the basis for the multiplier analysis, which traces the total impacts of CHEN in New Jersey.

Revenues

CHEN spending flows are made possible by its nearly comparable level of revenues, which in fiscal year 2000 totaled \$1,073,950,000. The following chart details the main sources of CHEN revenues:

Chart 2: CHEN Revenues in Fiscal Year 2000 (in \$1,000s)



Source: CHEN * Total revenues listed in Chart 2 are slightly less than reported expenditures in Table 1 due to differences in institutional databases.

- Total CHEN revenues in FY 2000 were nearly 1.1 billion dollars, up from \$900 million in 1996.
- Revenues from services, tuition, government grants and contracts, private gifts, endowments, sponsored research and other sources accounted for over 70% of the total. Direct appropriations from the State of New Jersey accounted for less than 30% of total CHEN revenues.

Importantly, the support provided by government leverages a substantial level of economic activity, jobs, wages and additional tax revenues for the State of New Jersey.

Jobs and Payroll

The CHEN institutions, like other higher education institutions, are labor-intensive operations, reflecting the educational mission of the schools. All together, in fiscal year 2000, CHEN schools employed 11,870 people with a payroll of over \$481 million annually. The vast majority of CHEN employees (94%) are New Jersey residents with 43% of the New Jersey residents living in Essex County. Over 2,000 employees reside within the City of Newark. The following table provides details on both jobs and payrolls:

Table 3: CHEN Employment and Payroll in Fiscal Year 2000

RESIDENCE	FULL-TIME EMPLOYEES	PART-TIME EMPLOYEES*	TOTAL EMPLOYEES	TOTAL FTE** EMPLOYEES	PAYROLL (IN 1,000s)
Newark	1,444	613	2,057	1,750	\$48,471
Remaining Essex County	2,219	518	2,727	2,478	\$120,619
Remaining New Jersey	4,500	1,860	6,360	5,430	\$278,192
Out-of-State	576	140	716	646	\$34,524
Total	8,739	3,131	11,870	10,304	\$481,806

* In addition to these employees, several hundred students are employed in part-time positions at the CHEN institutions, many through federal work-study programs.

** Full-time equivalent. Assumes two part-time jobs equal one full-time job.

Source: CHEN

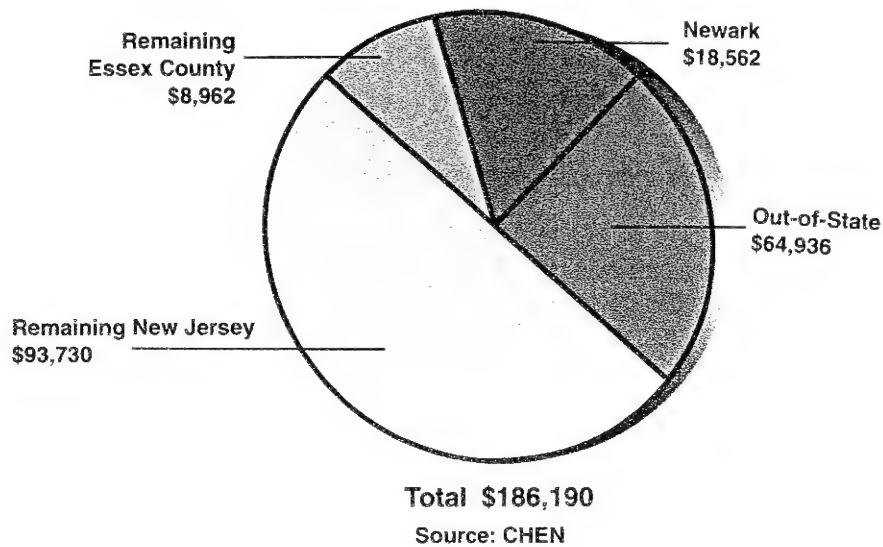
- Total employment at the CHEN schools amounted to 11,870, with 8,739 full-time positions and 3,131 part-time positions. The Full-Time Equivalent (FTE) for all employees at CHEN is 10,304 in fiscal year 2000.
- Over 93% of the full-time employees and over 95% of the part-time workers are New Jersey residents. Forty percent of all CHEN employees reside in Essex County with 2,057 living in Newark.
- Payroll totaled \$481 million, of which \$447 million was paid to New Jersey residents.
- Essex County residents received \$169 million of the New Jersey payroll total while Newark residents received \$48 million.
- New Jersey State taxes withheld during FY 2000 totaled \$14.0 million.
- Federal taxes withheld during FY 2000, including FICA, totaled \$109 million.
- Pension plan contributions totaled \$46.3 million, with one-half contributed by employers and the other half by employees.

The payroll and employment data serve as an important component in the multiplier analysis to generate the results for total economic impacts.

Vendors

In addition to CHEN's sizable expenditures for direct labor and other labor-related expenses, a large portion of total operating expenditures goes to vendors of goods and services. The following chart shows the estimated dollar amounts received by New Jersey vendors from CHEN:

**Chart 4: CHEN Purchases, by Vendor Location,
in Fiscal Year 2000 (in \$1,000s)**



- New Jersey vendors were the primary beneficiaries of CHEN spending for goods and services, receiving nearly two-thirds of the \$186 million total.
- Essex County vendors sold \$27.5 million in merchandise and services to CHEN institutions. Newark businesses accounted for \$18.6 million of this total, up from \$10.5 million in 1991.
- Special certified businesses (comprising minority-owned, women-owned, and small businesses), accounted for \$18.9 million in sales to CHEN.

The large proportion of dollars flowing from CHEN operations to local and statewide vendors in New Jersey assures that much of the economic and fiscal impacts on suppliers of manufactured goods, wholesalers and service providers are captured and retained within the state.

Capital Investment

One of the most critical needs of the Newark economy has been, and continues to be, a steady stream of capital investments to revitalize the City's capacity to meet future needs. CHEN has been a central force in helping meet this need over the past decade, and plans for the next five years show acceleration in the rate of construction. Capital investment also benefits Newark, Essex County and the State of New Jersey by generating short-term construction jobs, income and taxes.

- Between 1990 and 2000, CHEN schools invested a total of \$408.5 million in the construction of buildings, facilities and equipment (counting investments of \$0.5 million and over). These investments improve the efficiency of the schools and extend their capacity to deliver services in the long term. Work on these projects has generated a substantial number of short-term construction jobs, income for the local economy and tax revenue for the state. A list of the major projects completed is provided below.

Table 5: CHEN Major Capital Investments 1990-2000

CONSTRUCTION PROJECT	MILLIONS OF DOLLARS
Center for Law and Justice (Rutgers)	\$50.0
Renovations: Central Admin./Academic Facilities (UMDNJ)	38.0
University Hospital Master Utility (UMDNJ)	30.0
Doctors Office Center (UMDNJ)	29.8
Weston, Colton and Campbell Halls (NJIT)	27.0
Cogeneration (UMDNJ)	21.2
Aidekman Research Center (Rutgers)	20.0
Renovations: University Hospital (UMDNJ)	17.8
Cyprus Hall (NJIT)	14.5
Laurel (residence) Hall (NJIT)	14.0
Doctors Office Center Parking Garage (UMDNJ)	13.3
Parking Deck (NJIT)	13.0
Central Avenue Building (NJIT)	12.0
Woodward/Stonsby Res/Dining Hall (Rutgers)	12.0
Center for Technology and Student Center (ECC)	10.6
Facility Upgrades to Kupfrian Hall, GITC, Geo Lab and EDC II (NJIT)	10.6
Micro Electronics Building (NJIT)	10.0
Renovation of Bradley Hall (Rutgers)	9.5
Additional Technology, Computing, Instructional and Research Facility Upgrades (Rutgers)	9.0
Management Education Center (Rutgers)	6.7
Addition to Dana Library (Rutgers)	6.0
Addition to Golden Dome Ath. Center (Rutgers)	6.0

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Additional improvements to physical infrastructure (Rutgers)	5.5
Gymnasium Addition (NJIT)	5.1
Additional renovations, expansions and upgrades (ECC)	4.9
CHEN Building (NJIT)	4.5
Student Mall (NJIT)	2.5
Training, Inc. (ECC)	2.0
Free-Electron Laser Laboratory (Rutgers)	2.0
43 & 47 Bleeker Street (Rutgers NJSBDC)	1.0

Source: CHEN

- Plans are currently underway for further investments totaling \$406.3 million over the 2001-2005 period. These new investments will further strengthen CHEN's capacity to perform its basic mission and expand its contribution to the local community. At the same time, the region will benefit from the additional economic activity generated from construction.

Table 6: CHEN Major Capital Investments Projected for 2001-2005

CONSTRUCTION PROJECT	MILLIONS OF DOLLARS
Renovations: Central Admin./Academic & Clinical Facilities (UMDNJ)	\$57.9
Campus Center (NJIT)	45.0
New UBHC Building (UMDNJ)	37.6
Academic Building (NJIT)	30.0
NJDS C&D Level Expansion (UMDNJ)	27.1
Renovations: University Hospital (UMDNJ)	22.0
Technology Infrastructure Upgrades (Rutgers)	20.0
Renovations and Upgrades (ECC)	19.7
Research Space (NJIT)	17.2
Science Additions and Renovations (Rutgers)	16.5
Laurel Hall (NJIT)	15.0
Research Space (UMDNJ)	15.0
Cancer Center (UMDNJ)	12.4
NJMS Education Space (UMDNJ)	10.6
NJMS Women & Children's Wellness Center (UMDNJ)	10.0
Fire Academy (ECC)	10.0
Facility Upgrades to Bradley, Ackerson, Blumenthal, Conklin and Engelhard Halls (Rutgers)	9.0
Additional physical infrastructure improvements (Rutgers)	7.2
Megastructure Expansion (ECC)	6.0
Parking Addition (NJIT)	5.7
Electrical and Computing Engineering Addition (NJIT)	4.6
Dana Library Fit-Out (Rutgers)	3.3

Additional Instructional and Research Upgrades (Rutgers)	3.0
Cornwall Center for Metropolitan Studies (Rutgers)	1.0
One Stop Work First Center (ECC)	0.5

Source: CHEN

The economic impacts of these capital investments are not limited to the construction industry alone. Through the multiplier effect, numerous other industries throughout the state and the Newark region benefit from increased sales of materials and services, generating additional jobs, income and tax revenues.

TOTAL IMPACTS

The initial round of spending by CHEN institutions sends a ripple effect throughout the local and state economy. Institutional expenditures for payrolls as well as for goods and services are in turn spent by CHEN workers and CHEN suppliers, leading to additional rounds of spending and purchases within the area's economy. Each round generates new economic activities creating additional jobs, income and tax revenues. The multiplier effect captures all the rounds of this ripple effect within the area's economy.

Multiplier Methodology

The multiplier adds two components to the direct effects. These are the indirect effect and the induced effect. The indirect effect traces the direct spending related to institutional expenditures for goods and services to their suppliers where additional economic activity is generated. The induced effect traces the spending of wage earners at the institutions and their suppliers, again generating new activities in a variety of industries. The multiplier effect is expressed as the ratio between the resulting total spending in the area's economy (direct, indirect and induced) and the initial direct spending by the institutions. For example, a multiplier of 2 means that for every dollar in direct spending, there is an additional dollar generated in indirect and induced spending within the impact area.

To estimate the multiplier effect, this study utilizes the RIMS II Model of the U.S. Bureau of Economic Analysis, which was specifically estimated for the State of New Jersey and Essex County. The model is based on the Input-Output method, which depicts the structure of sales and purchases throughout all sectors of the New Jersey economy. Detailed expenditure data provide by CHEN were regrouped and applied to the appropriate RIMS II multipliers, taking into account "leakages" of spending that occur outside the state. The results of the model analysis show the total spending impacts, total earnings and total employment in New Jersey and in Essex county. In addition, tax revenues by the state are estimated using effective tax rates as applied to total earnings generated in the New Jersey economy by CHEN institutions. The model is applied separately to annual operating expenditures and to capital investments.

Total Impacts from CHEN Operations

The full effects of CHEN spending are felt throughout the Newark area and the state economy as industry after industry receives payments for goods sold or services rendered to a CHEN institution or a CHEN employee. Even further down the line, other New Jersey suppliers who do business with CHEN's direct suppliers also benefit from such economic transactions. When all the rounds of the multipliers are worked through, the total impacts of CHEN spending in the State of New Jersey and in Essex County is substantial. The following table summarizes the results of the multiplier analysis using the RIMS II economic impact model:

Table 7: Total Economic Impacts in New Jersey and in Essex County from CHEN's Operations in Fiscal Year 2000 (in \$ millions)

IMPACT CATEGORY	DIRECT EFFECTS	TOTAL IMPACTS IN NEW JERSEY	TOTAL IMPACTS IN ESSEX COUNTY
Economic Activity (Spending)	\$1,104.5	\$2,636.8	\$1,511
Wages	\$481.8	\$917.3	\$538
Jobs (FTE)	10,304	24,558	12,124

Source: CHEN; Bureau of Economic Analysis RIMS II Model

The results show that:

- Over \$2.6 billion dollars in total spending were generated in the State of New Jersey as a result of the initial CHEN expenditure of \$1.1 billion in fiscal year 2000.
- Total wages earned in New Jersey amounted to \$917 million, with \$481 million representing direct CHEN wages and the rest earnings by workers in various supplying industries throughout the state.
- CHEN activities generated a total of 24,558 jobs (measured in full-time equivalents) throughout the state, of which 10,304 were at the CHEN institutions.
- The bulk of these New Jersey impacts, including multiplier effects, were generated in Essex County, with \$1.5 billion in total spending (including \$537 million in wages) and 12,124 jobs. The City of Newark is the focal point of these impacts.
- For each dollar in direct appropriations provided by the State of New Jersey, CHEN generated \$8.47 in total spending (economic activity), including \$2.94 in wages throughout the state's economy.

Total Impacts from CHEN Investments

In addition to the annual impacts resulting from CHEN operations, capital investments for construction of new facilities generate short-term benefits in the construction sector and other industries that supply goods and services to it. These impacts are felt during the construction period as well as in the period immediately prior to construction as suppliers gear up for the projects, and after construction as suppliers readjust inventories. Using the multiplier effect, these impacts can also be measured in terms of total economic activity, income and jobs. The following table highlights the total impacts of CHEN investments based on the RIMS II Model during the 1990-2000 period:

Table 8: Total Economic Impacts in New Jersey from CHEN's Capital Investments during 1990-2000 (in \$ millions)

IMPACT CATEGORY	DIRECT EFFECTS	TOTAL IMPACTS IN NEW JERSEY
Economic Activity (Spending)	\$409	\$923
Wages	\$127	\$272
Jobs (in person-years)	3,331	7,843

Source: CHEN; Bureau of Economic Analysis RIMS II Model

The results show that the \$409 million spent by CHEN on new capital programs during the 1990-2000 period produced 3,331 person-years of employment in the New Jersey construction sector and a total of 7,843 person-years of employment throughout the state, including the many supplying industries who provided materials for construction and services, such as architecture and financing. Statewide economic activity related to this capital spending totaled \$923 million and wages earned by workers totaled \$272 million.

The following table highlights these impacts for CHEN's planned investments during the 2001-2005 period:

Table 9: Total Economic Impacts in New Jersey from CHEN's Planned Capital Investments in 2001-2005 (in \$ millions)

IMPACT CATEGORY	DIRECT EFFECTS	TOTAL IMPACTS IN NEW JERSEY
Economic Activity (Spending)	\$406	\$918
Wages	\$126	\$270
Jobs (in person-years)	3,313	7,801

Source: CHEN; Bureau of Economic Analysis RIMS II Model

Capital investment projected by CHEN for the 2001-2005 period shows an accelerated construction program with a total of \$406 million. The expected job generation in the construction-related trades is 3,313, while the total job creation throughout New Jersey is expected at 7,801. Total economic activity estimated for New Jersey related to this capital program is \$918 million, and total earnings by workers is \$270 million.

It is important to note that while the construction impacts are short term, the positive effects of the investments on long-term operations can ultimately be quite substantial. For example, investments in the Science Park are expected to attract many new activities that will generate new, ongoing operating impacts in Newark.

Fiscal Impacts

As shown in the prior section, CHEN is a major generator of economic activity, income and jobs for New Jersey, with much of this impact occurring in Essex County and the City of Newark. Another important contribution of CHEN's operations and investments is the creation of tax revenue for the State of New Jersey. For example, CHEN employees pay income tax on their earnings and sales taxes on their retail spending. Suppliers of goods and services pay business taxes and other fees while their workers also pay income and sales taxes.

To estimate CHEN's tax impacts, the appropriate effective tax rates (based on actual statewide tax collections relative to actual statewide wages) for New Jersey were applied to CHEN generated wages. The results of this analysis show the following tax impacts:

- Total New Jersey state taxes generated from CHEN operations in fiscal year 2000 are estimated at \$80.4 million.
- Total New Jersey state taxes generated from CHEN investments in an average year during the 1990's are estimated at \$2.3 million. During the 2001-2005 period the average annual figure is estimated to rise to \$4.9 million.
- Therefore, for each dollar provided by the State of New Jersey in support of CHEN activities and programs, twenty-seven cents are recaptured by the state treasury in the form of tax revenues generated each year. This is a conservative figure, not including other tax revenues generated from student and visitor spending.

In addition to state taxes, CHEN also generates millions of dollars in local property taxes in Essex County and other New Jersey counties. These taxes are paid by CHEN employees as well as by other New Jersey workers included in the CHEN multiplier effect.

CHEN CONTRIBUTIONS TO COMMUNITY DEVELOPMENT

The quantitative economic contributions of CHEN institutions, as captured in the analysis above, tell only a part of the story of their overall impact. It tells of the measurable components of the schools' activities and spending, in effect, looking at the organizations as businesses. However, the sum of CHEN impacts on its community is enormously greater. Day-by-day, through their many programs and activities, and the efforts of their employees and students, the schools also make critical contributions to the life of community residents with major benefits to overall regional economic development.

While such contributions often do not lend themselves to quantification, it is clear that they make a difference in Newark's long-term economic growth prospects. This is particularly significant in the area of human capital development and the preparation of young people for the jobs of tomorrow, as well as working directly with government and businesses to meet social and economic goals to the benefit of all residents.

With 26,265 students, a staff of 11,870 and over 7,000 degrees and certificates awarded annually, CHEN and its alumni who bring talent and know-how to positions they hold locally throughout the state, constitute not only a major economic base today but also an engine for future growth and development in Newark, its surrounding region and the entire state.

The number of specific programs and activities offered by CHEN in support of its community is quite large. The following description of some of the key programs and activities provides some insights into CHEN's community involvement and its contributions to local economic development.

CHEN Institutional Status



The very presence of a dynamic academic complex with a multiplicity of reputable and highly accredited educational and research programs in the heart of Newark is a major economic asset to the City and helps to elevate its perception as a business location.

CHEN institutions are fully accredited and highly ranked in numerous academic areas. They offer dozens of degree programs ranging from 2-year associate degrees to post doctoral programs. High caliber faculty is well represented in national rankings and well accomplished in the senior ranks of national academic organizations. While the list of accreditations by accrediting agencies in various academic fields would be several pages long, here are just a few examples of school rankings:

- *US News and World Report* ranks Rutgers-Newark first among national universities in student diversity. This is the fourth year Rutgers received this designation.
- In 1999 *US News and World Report* ranked Rutgers-Newark as one of the top 50 "great schools at great prices".
- *Money Magazine 1998: Best College Buys Now* ranked NJIT as the sixth "Best Value" among the top "Scientific and Technical Schools" in the United States.
- *U.S. News and World Report: 1999 Annual Guide to America's Best Colleges* placed NJIT among the top one hundred "Best National Universities" for the fifth straight year.
- UMDNJ is the nation's largest health sciences university with five regional campuses and a network of more than 200 affiliated teaching hospitals and educational partners that span the state.
- *New York* magazine named 60 UMDNJ physicians among the best in the tri-state area. They were chosen from a variety of specialties including family practice, internal medicine, immunology, cardiology, child and adolescent psychiatry, dermatology and gastroenterology.
- The UMDNJ-University Hospital is northern New Jersey's only Level 1 Trauma Center and is the center of referral for many of the state's most advanced medical services and specialty care programs. It is also the single largest provider of both Medicaid and Charity Care in New Jersey.
- The Rutgers School of Criminal Justice is generally regarded as among the top three in the nation.
- *Business Week* ranks Rutgers Business School among the top 70 of 1,200 business schools in the U. S.

- Essex County College ranked 43rd in the number of Associates Degrees awarded to students from minority population groups in 1997-98, according to *Community College Week*.
- Yahoo ranked NJIT as the nation's "most wired " public university campus for three consecutive years.
- The New Jersey School of Architecture at NJIT is viewed as one of the foremost in the nation in CAD applications and has been cited by numerous trade and industry publications as one of the best. For the fifth consecutive year, New Jersey School of Architecture students took top honors in the annual CADDIE awards competition for CAD applications.
- UMDNJ ranks among the 100 top research institutions in the country, as measured by National Science Foundation studies that rank research universities by total amount of federal awards.
- The Rutgers College of Nursing is ranked 59th in the nation and the Program in Psychiatric Mental Health is ranked 5th in the nation, according to *US News Grad School Guide*.
- Rutgers School of Law-Newark is ranked number one academically among law schools in the state by *US News and World Report*.
- The UMDNJ-New Jersey Medical School ranks 8th overall, and 6th among schools that are not historically minority institutions, in total number of African-American graduates from 1950 – 1998 according to the AAMC report *Minority Graduates of US Medical Schools: Trends 1950 – 1998*.
- All four CHEN institutions are listed in *The Hispanic Outlook's* publisher's picks as among those colleges and universities nationwide that offer solid opportunities for Hispanic students.
- UMDNJ is classified by the Carnegie Foundation within the category: Professional School and other specialized institutions.
- Rutgers-Newark and NJIT are ranked in the Carnegie Foundation Classification as a Doctoral Intensive university.

Research



Tens of millions of dollars in research grants are awarded to CHEN institutions from public and private sources each year. The research is diverse, representing numerous departments and programs within the institutions. The institutions have a proven base capable of delivering cutting edge research in such areas as medicine, biotechnology,

computer sciences, manufacturing methods and social sciences. Many of the research initiatives involve issues of concern to New Jersey. Following are some examples of these research programs:

- **Computer Program Aids Language-based Learning Problems:** Rutgers, in collaboration with the University of California-San Francisco, has developed computer software training programs to aid children with dyslexia, autism, attention deficit, and other language-based learning problems. The programs have aided 90 percent of some 15,000 users to make substantial gains on standardized language tests.
- **Information and Communications Systems:** NJIT's *New Jersey Center for Multimedia Research (NJCMR)* funded by the New Jersey Commission on Science and Technology has been working to successfully integrate multimedia into education on a variety of different levels.
- **Sustainable Production Systems:** Multi-lifecycle engineering research is a comprehensive, systems approach to growing a strong industrial economy while maintaining a clean, healthy environment. NJIT's *Multi-lifecycle Research Center*, established in 1996, is an industry-driven initiative involving broad interdisciplinary research and educational programs that cut across all the traditional engineering areas as well as architecture, economics, policy studies, management and computer science.
- **Biomedical Engineering & Bio-Materials:** NJIT's Human Genome Project and other biomedical research initiatives have yielded huge amounts of new biological data. A major focus of such research is the identification of patterns in this biomolecular data, particularly in DNA and RNA. A research team at the Data and Knowledge Engineering Laboratory brings together computational molecular biology with the approach known as data mining.
- **Transportation and Infrastructure:** New Jersey Department of Transportation has designated NJIT as the International Intermodal Transportation Center (IITC), a university-based resource program that will work closely with public and private sector transportation stakeholders to facilitate economic development and quality of life improvement efforts linked to the intermodal transportation corridor.
- **Schizophrenia Gene:** A team of researchers from Rutgers-Newark, the UMDNJ-New Jersey Medical School (NJMS), and other institutions identified a region on Chromosome 1 that appears to be linked to the development of schizophrenia. The evidence is approximately 100 times stronger than prior research on schizophrenia.
- **Treatment for TB:** The CDC awarded the New Jersey Medical School National Tuberculosis Center at UMDNJ a \$4.3 million grant to develop more effective treatments for TB. The 10-year project will include both clinical and scientific research on the diagnosis, clinical management and prevention of this disease.

- **Prostate Cancer Treatment:** A new non-surgical approach to treating patients with enlarged prostates, developed at NJMS, was tested at a dozen medical centers around the country. The technique, called chemical ablation of the prostate, utilizes a device called InjecTx to inject alcohol into the enlarged gland. The swollen tissue is destroyed and urinary function returns to normal.
- **Therapies for Gulf War Syndrome:** Researchers at the NJMS are participating in one of the first large-scale clinical trials to test the effectiveness of treatments for Gulf War Syndrome. One study is looking at antibiotic treatment and the other is investigating the role of aerobic exercise and behavioral therapy to improve function and quality of life.
- **Risk Factors of Retinopathy:** Researchers at NJMS identified four factors in African-Americans with Type 1 diabetes that significantly increase their risk of developing serious problems with eyesight. The research team discovered that patients who have diabetes for at least 15 years and also have kidney disease, high blood pressure or high blood sugar were more likely to develop complications.
- **New Treatment for a Life-threatening Disorder:** Rutgers is developing a treatment for Septic Shock Syndrome, a life-threatening disease (survival is only 50%) resulting from excessive activation of the immune system after a massive bacterial infection. The research indicates a new VIP injection might be effective in treating humans with Septic Shock Syndrome as well as for autoimmune diseases such as rheumatoid arthritis and lupus.
- **Infrared Spectroscopy Aids in Osteoporosis Research:** Rutgers is collaborating with a group of scientists, physicians and surgeons to develop an experimental technology that generates an infrared image of human tissue such as bone. The goal of this technology is to give pathologists some molecular understanding of healthy bone, and to help determine what therapeutic interventions are most effective for pathological conditions such as osteoporosis.
- **Sleep is Critical to Memory:** Rutgers research into how neural network activity occurs in the brain's hippocampus could have enormous impact in studying memory loss. This critical research is helping to unravel the connections and ultimately the causes of brain diseases incapacitating millions of people.

Patents



In recent years, CHEN and its staff have been granted dozens of significant patents in a wide range of scientific and technological endeavors. These accomplishments not only advance the overall knowledge base but also create a stream of future revenues from those patents that find successful commercial applications. Some examples of patent titles include:

- "Stabilizing and delivery means of biological molecules." UMDNJ.

- “Method and Device for Enhancing the Recognition of Speech Impaired Individuals.” Rutgers.
- “Multi-wavelength imaging pyrometer.” NJIT.
- “Electron Beam Irradiation of Gases and Light Source.” Rutgers.
- “Comparative determinants of viscosity in body fluids obtained with probes providing increased sensitivity.” UMDNJ.
- “Process for the removal of NOX from fluid streams. NJIT.
- “Methods & Apparatus for Isotopic Analysis.” Rutgers.
- “Hypercoagulability comparative determinants obtained using detection systems with variable force-induced energy inputs.” UMDNJ.
- “Single step process and apparatus for isolation and purification of biomolecules.” NJIT.



Community Service

CHEN's proactive engagement in the provision of services and programs that support present and future community needs is a critical component of the schools' overall contribution to the area's economic development. CHEN staff and students are engaged year-round in providing direct services and reaching out to those in need and the disadvantaged. Such services improve the quality of life in the community and enhance the capacity of its residents to become more productive contributors.

Direct services provided by the CHEN institutions that benefit the local community and the State include job training, student preparation, employment services, family support programs, homecare education, safety education, senior education programs, continuing education, policy studies and use of school facilities by community groups. The following describe a few of these many programs:

- Rutgers-Newark inaugurated the Joseph C. Cornwall Center for Metropolitan Studies in the spring of 2000. To help strengthen the urban outreach efforts of the entire Newark campus, the center will conduct applied research on urban policy issues in Newark and elsewhere in northern New Jersey. To enhance faculty distinction in the social sciences, the center will also foster scholarships in urban studies.
- Upward Bound, a national effort to assist under-prepared students from urban public schools, is a multiyear program that addresses low graduation rates in high schools by providing tutoring, counseling, and career guidance. The Saturday

Academy at Rutgers, which prepares high school students to take the SATs, was expanded to include sophomores as well as juniors and seniors.

- Rutgers University is also extending its networking infrastructure to connect the major educational and cultural centers in Newark. Partially funded by a U.S. Department of Education grant, the university will extend its fiber-optic-based network infrastructure (RUNet 2000), to the Newark Public Library, the Newark Museum, the New Jersey Historical Society, New Jersey Network (NJN), WBGO, Science High School, and NJPAC. Also planned are video and data networking connections to NJIT, UMDNJ, and University Heights Science Park.
- Rutgers-Newark established the Newark Center for Families and Communities (NCFC) in 1998 to offer comprehensive health care, social, educational, and legal services. Through the NCFC's various programs, which include the College of Nursing, Newark College of Arts and Sciences, and the School of Law, students develop and sustain a commitment to service; faculty respond to challenges in local neighborhoods; and various nonprofit, public, and governmental agencies gain technical assistance.
- NCFC's Rutgers Community Outreach Partnership Center, sponsored by the U.S. Department of Housing and Urban Development, is an initiative that assists community-based organizations in Newark's revitalization. In collaboration with Rutgers-Newark Writing Center and various nonprofit organizations, the NCFC and college mentors worked with neighborhood youth to produce a publication and website featuring their community entitled, "One Block Over: A Multimedia Project of the West Side Park Community."
- Rutgers-Newark is working with the New Jersey Superior Court Family Division to develop a similar court for the City of Newark, to manage child abuse and neglect cases involving parental substance use. The goal emphasizes early assessment and intervention for children, keeping families intact. The family drug treatment court model provides access to an integrated network of social, employment and health services. It also holds the court system and child protective services agencies to a higher standard of accountability than regular family courts, so children do not languish in foster care.
- Community and Customized Programs: ECC's community and customized programs provide 7,000 individuals each year with training. These programs include Training Inc., which provides career training to persons seeking entry and reentry to the workplace; Customized Company Training, through which ECC faculty and consultants provide employees at area companies with specialized training in everything from English language skills to advanced engineering software applications; and the Workforce Development and Family Development programs, which provide area residents with intensive literacy and computer skills.
- Career Ladder Program: This program, conducted for the Newark Teachers Union, enrolls paraprofessionals from the Newark Public Schools in ECC's degree program

for early childhood and elementary education. All year-2000 graduates plan to continue their education at four-year institutions.

- **Ironbound Community Corporation:** ECC's affiliation with Ironbound is approaching its 29th year. A "college-going experience" is provided for approximately 300 students annually at the community center. ECC also partners with Ironbound to administer the Family Friendly Center Program for parents at Hawkins and South Street Elementary Schools.
- **Fresh Air Fund:** Fifteen summer campers, sponsored through the Fresh Air Fund, participated in On-Campus Continuing Education's six-week Reading Enrichment Program at Essex County College.
- **Senior Education Program:** Arts and Crafts and Senior Fitness courses were provided at ECC for 128 seniors at nine locations in four municipalities. Approximately 277 other Senior citizens came for computer classes scheduled exclusively for this population.
- **FOCUS:** This longstanding program of almost 25 years, consisting of college courses, serves close to 225 students annually at the FOCUS Broad Street location. These students eventually transfer to the ECC Main Campus to complete graduation requirements.
- **ECC's School-To-Careers Summer Business Simulation:** Sixteen students from Shabazz and Technology High Schools participated in Training, Inc.'s simulated corporation, Gigs & Bytes. Students acquired proficiency in computer applications as they assumed various roles within the simulated company.
- **Employment Opportunity Days:** The third Thursday of each month, 15 to 20 employers are invited to ECC to interview applicants, primarily job training and job search participants, for job openings. Most participants are given second interviews at the company site.
- **Newark International Airport:** In cooperation with the Port Authority of New York/New Jersey, ECC's Office of Corporate and Business Training provided one-day training sessions in customer service for over 200 employees at the airport.
- **Office of Community and Public Service:** This NJIT office links classroom theory and concepts with practical applications in the community. The activities related to this program include: Community Service Work-Study, in which 30 NJIT students worked in 18 Newark area non-profit organizations during FY98; NJIT Literacy Corps, an initiative, begun in Fall 1997, in which 85 NJIT students provided off-campus tutoring and literacy development activities in 15 non-profit agencies and public schools; Housing Scholars, a program under which 28 students worked in 20 agencies during the summer of 1998; and, Service Learning, a program in which 170 NJIT students participated in service learning projects at over 35 local community-based agencies during the FY98.

- **Volunteer Clearinghouse:** Collaborative volunteer activities were sponsored during the year with other NJIT organizations and departments (e.g. fraternities, health services). Over 175 NJIT students volunteered for such activities as New Community Corporation/Home Depot "Playground Build," Habitat for Humanity "Blitz Build," and the annual fraternity "Blood Drive."
- In 1998, NJIT launched, in collaboration with the New Jersey Chamber of Commerce and KPMG, a virtual help desk program for selected public schools. Faculty and staff from the selected schools can call the help desk hotline, which is staffed by NJIT students, to help the schools resolve basic computing and technology problems and issues.



Healthcare Services

Primarily through UMDNJ programs, the Newark area community also benefits from a variety of healthcare services. These include medical services, dental services, health education programs, crisis intervention, support for individuals with disabilities and health screening. For example:

- **University Hospital community outreach program:** Each year, the UMDNJ-University Hospital provides free health education programs to its communities as part of its extensive outreach program. This program consists of health screenings and educational exhibits, classes and workshops, speaker's bureau, Hospital tours, and career awareness programs. This outreach effort, composed of a team of more than 50 physicians, nurses, technicians, health educators, and outreach workers, reach more than 10,000 adults and children annually. Topics covered are wide-ranging, and are designed to equip participants with the tools to become better stewards of their health.
- **The UMDNJ-New Jersey Dental School** provides care to residents in the Newark area. The School's clinics accommodate over 60,000 patient visits annually and provides care ranging from emergency and preventive services to specialized tertiary care services such as cleft lip/palate repair and dental implant placement.
- **New Consortium Offers Dental Care:** The New Jersey Dental School has joined a new consortium of dental schools that offers free, oral screenings dedicated to early diagnosis of oral cancer in those who do not get regular check-ups.
- **FOCUS Community Health Center (UMDNJ-New Jersey Medical School and University Hospital):** Problems accessing health care is a major issue for many of New Jersey's minority populations. For example, one of five black persons and one of three Hispanic persons lack health insurance. As a joint project with FOCUS, a community-based organization aimed at improving health for Latinos in northern New Jersey, the Departments of Medicine and Pediatrics of the UMDNJ-New Jersey Medical School and University Hospital have opened a practice on Broad Street in downtown Newark in the FOCUS building. This practice site will serve the health needs of the community as well as training site for medical students, residents, and

the students enrolled in health career training at FOCUS. In addition, the site will serve as the base for school outreach programs in conjunction with the School Leadership Team IV serving schools mostly in Newark's North Ward.

- University Family Practice Center at Vailsburg: Affiliated with University Hospital and the New Jersey Medical School Department of Family Medicine, the practice is located in the heart of Vailsburg and provides medical care for the entire family including infants, children, teenagers, adults and seniors.
- National Tuberculosis (NJMS): A national resurgence of tuberculosis during the late 1980's and early 1990's saw a 65% increase in the number of TB cases in Newark. In response to this public health crisis, the New Jersey Medical School National Tuberculosis Center developed a multi-disciplinary team approach to TB patient management utilizing a nurse case-management model. Directly Observed Therapy (DOT) is the cornerstone of this public health effort. Outreach workers deliver TB medications to patients in the community and observe each TB patient ingest their medicine on a daily or intermittent basis as prescribed. This effort involves more than 25,000 patient encounters per year. TB Center staff also engages in community outreach through participation in health fairs and other public educational efforts. As a result of these efforts, TB incidence has decreased by 39% over the past three years.
- Student Health Advocates For Resources And Education (S.H.A.R.E.) Center (NJMS): The S.H.A.R.E. Center, founded in 1996, is a student run organization that promotes community service at UMDNJ - New Jersey Medical School in Newark. The S.H.A.R.E. Center serves as the forum for communication between the various community service activities at the medical school. In addition, the Center serves as a vital link between NJMS and the numerous outreach organizations in the Newark area.
- Broadway House (NJMS): For the third year, the NJMS Physical Medicine and Rehabilitation Department provided physical and occupational therapy services to Broadway House for Continuing Care. Broadway House is a 400-bed sub-acute care facility for AIDS patients located in Newark's North Ward. Therapy services are provided three days per week. During 1999 a total of 2,955 patient visits were performed, representing an increase of 12 percent over the 1998 volume. Newark ranks among the top five large U.S. metropolitan areas with the highest rates of AIDS cases due to intravenous drug use. Overall, New Jersey has the country's third-highest rate of HIV infection caused by intravenous drug use, according to the Centers for Disease Control.
- St. Columba Neighborhood Health Center, Newark (School of Nursing): The UMDNJ-School of Nursing (SN) provides support services for the Healthy Mothers/Healthy Babies Program at St. Columba's. Families enrolled in the WIC Program are evaluated and counseled about issues of nutrition, growth and development, childhood immunizations, and parenting. In addition, nursing staff is involved in a parenting workshop and support group that meets weekly during the fall and spring.

- The New Hope Baptist Church, Newark (School of Nursing): At this site the School provides wellness education and health screenings. A Faith-Based Health Program is planned in the near future. This program will offer health promotion information and a better understanding of community resources. Church members who participate in this program will then bring health related information to their fellow church members. Additional community health services offered by the School for Newark residents include educational workshops at the Marion P. Thomas Charter School, and educational workshops and group and individual counseling at the South Street and Newark Boys Chorus Schools.
- Dietetics - Food Stamp Nutrition Education Program (School of Health Related Professions): This continuing program, a collaboration with Rutgers University, improves and increases collaboration and cooperation among existing agencies and organizations that currently work with low-income audiences as well as other governmental agencies, nonprofit organizations, and private enterprises to improve nutrition education services available to persons receiving food stamps in Essex County. The program purpose is to provide nutrition education to community youth and adults receiving food stamps or free and reduced lunch by peer educators recruited from the community which are behaviorally focused, learner driven, outcome based nutrition education. Dietetic interns assist in planning and delivering this community based nutrition education during their food security rotations.
- Consultation and Advice To Mental Health Providers (SHRP): The department has provided consultation to several psychiatric rehabilitation agencies on a pro bono basis to help in the delivery of these critical community services.
- Crisis Hotline Created (UBHC): UBHC was awarded a \$400,000 Law Enforcement Crisis Intervention grant to create a hotline that will provide 24 hour crisis intervention to police officers throughout the state. Mental health professionals and volunteer police will provide telephone counseling every day of the year.
- The Rutgers College of Nursing provides direct assistance to underserved communities in Newark and Elizabeth through its program of Nurse-managed clinics. To date, two clinics have been opened in public housing facilities in Newark, and one clinic is operating in the Elizabethport section of Elizabeth. Area residents are able to receive health screenings and medical referrals from teams of nursing faculty, allied nursing staff, and student interns.
- The Graduate Center at Newark successfully launched a new master's degree in public health this year, and more than 100 students have enrolled for the fall 2000 semester. The Graduate Center, collaboration by Rutgers-Newark, NJIT, and UMDNJ, encourages shared research among these institutions while fully capitalizing on their combined resources. The master's in public health responds to a growing need for highly trained public health professionals, and addresses issues such as health care for high-risk, urban, and underserved populations.

- **Electronic Network Solutions for Rising Healthcare Costs** - This comprehensive study completed by NJIT in cooperation with Thomas Edison State College found that the state's healthcare industry could save \$760 million annually in the administrative costs of processing claims and medical information by adopting a set of standardized electronic forms and using electronic data interchange (EDI) technology.
- **New Jersey Immunization Program** - NJIT has put into production for statewide use the New Jersey Immunization Information System (NJIIS) and the New Jersey Local Information Network and Communications System (NJLINCS) for the New Jersey Department of Health and Senior Services. NJIIS is an on-line immunization registry capable of enrolling all New Jersey children at birth and recording and evaluating their immunization histories for completeness. JLINCS is an Internet based communications system that provides rapid, two-way communication between state health officials and local health officers for dissemination and collection of health related information and data. NJIT operates the servers and provides administrative and technical support for both programs.

Curriculum Development



In recent years, CHEN institutions both individually and jointly, have developed and introduced new degree programs in response to perceived need and student demand. These new programs are in a wide range of areas including health, business, urban affairs, international affairs and science. In addition, significant curricular changes have been taking place across the board in existing programs to reflect changing needs and new technologies. Here are some examples:

- The addition of joint programs among NJIT, Rutgers and UMDNJ in recent years is particularly significant. Some of the more notable are UMDNJ-School of Public Health, which began offering the M.P.H. Degree in the Fall of 1999; the joint Ph.D. Program in Urban Systems; and the International Center for Public Health being developed at the University Heights Science Park.
- Over the past five years Rutgers-Newark has developed new degree programs from the Bachelor through Ph.D. levels. Almost all of these programs, totaling 42, are in the physical and life sciences, business, urban issues, and global affairs areas. A few additional programs in the arts and humanities were also developed in response to perceived need and student demand. Many of the programs are joined with NJIT and/or UMDNJ (some of these programs are new, while in other cases programs offered at one institution have been strengthened and expanded by converting them to joint programs). In addition, two centers have been established at the campus within the past five years: The Center for Global Change and Governance and the Joseph C. Cornwall Center for Metropolitan Studies.
- ECC's credit programs have kept pace with developments in the marketplace. New degree and certificate programs have been developed in alcohol and substance abuse, communications and web page design, and existing programs have been upgraded to reflect current knowledge and professional practices. Several joint health science programs with UMDNJ retain their outstanding records and

reputations. Graduates of the college's nursing, radiography, physical therapy assistant and networking technology programs boast 100% or near 100% passing rates on licensing or certification exams in any given year.

- During the 1999-2000 academic year 69 non-credit courses were developed at ECC in an effort to address changing market needs. Forty-four of the new non-credit courses are continuing education opportunities for law enforcement officers. These courses were developed based on the results of a survey of all law enforcement agencies in Essex County. Approximately 800 law enforcement officers from departments every municipality in Essex County, as well as out-of-county officers, participated in these offerings. Nearly all of the other courses were computer courses designed to provide initial employment, career advancement or customized training for specific companies.
- NJIT Degree Programs continue to change in response to needs. NJIT currently offers 96 degree-programs (33 bachelors programs, 41 masters programs, 4 degree of engineer programs, and 18 doctoral programs). In addition, NJIT's Division of Continuing Professional Education (CPE) offers a variety of targeted programs, including Distance Learning Program, Graduate Certificate Program (20), Extension Programs, Non-Credit Learning, Corporate Training, and Professional Development and License Reviews.
- In response to changing market needs, UMDNJ has acted on several fronts. Community-based clerkships in Family Medicine and Substance Abuse were introduced in 1995 and are now firmly established at the New Jersey Medical School. Because of the quality and extent of its clinical skills assessment program, the UMDNJ-New Jersey Medical School has been chosen as one of 30 medical schools to serve as testing centers for a new component of the US Medical Licensing Examination that will be given in 2002-03.
- At the New Jersey Dental School, students are provided a voluntary Community Oriented Dental Education Program consisting of a yearlong, community-based educational experience. The School of Health Related Professions has created a total of fourteen new graduate and undergraduate programs since 1995 in areas such as Biomedical Informatics, Health Sciences and Psychiatric Rehabilitation. The Graduate School of Biomedical Science at Newark developed a multidisciplinary M.S. program in Biomedical Sciences. The School of Public Health began offering the M.P.H. (Masters in Public Health) on the Newark campus in 1999. The program offers concentrations in four areas: Health Policy Administration, Quantitative Methods: Biostatistics and Epidemiology, Urban and Environmental Health and Dental Public Health. Also established in recent years have been eleven new dual/articulated degree programs, including M.D./Ph.D., D.M.D./M.P.H. and M.D./J.D. Every part of the University has seen other important changes in the curriculum. Beginning in the fall of 2001, freshman dental students will begin receiving all written and audiovisual material on a DVD. UMDNJ's New Jersey Dental School will be among the first postsecondary educational institutions nationally to apply this technology to digitize and delivery their entire curricular content.

Pre-College Programs



The CHEN schools, either jointly or individually sponsor numerous academic enrichment programs designed to reach their base community and increase the number of minority applicants in the area. A wide range of pre-college activities involve all segments of the Newark school system, such as academic support services to students and faculty to increase the retention and graduation rates, strengthening student academic and study skills, SAT preparation and teacher training at feeder schools. Some highlights of these programs include:

- NJIT provides professional development/teacher training programs and other services to the Newark Public Schools. The development workshops and activities are designed to align K-12 teaching and curriculum content in science and math with N.J. Core Curriculum Content Standards, having provided standards workshops to all K-8 Newark teachers. NJIT maintains a resource center for teachers to explore and pilot curriculum materials and resources before using them in their classrooms. Some of the key outreach programs include:
 - The Elementary Science Outreach, which provides professional development in science for Newark teachers.
 - Summer Programs in mathematical, science, language arts and engineering.
 - The Computing and Composition Project that serves sixty Newark students in the tenth through twelfth grades, and their teachers with instruction and laboratory sessions that integrate computer programming, and problem solving/critical thinking with the fundamentals of English composition.
 - The Pre-College Academy that provides Newark High School seniors a college-credit pre-calculus course that prepares the students to enroll in physics as entering freshmen.
 - The Talent Search Program that encourages youth to take an active interest in developing and pursuing academic, career, and personal goals. This year round program provides approximately 1,000 Newark students and their parents/guardians with the necessary skills and motivation needed to achieve academic success, graduate from middle and high school, and eventually enter college.
- One of the major goals of the Rutgers-Newark mission involves enhancing the quality of education in the Newark school system. Efforts to attain this goal have resulted in a plethora of pre-college activities, which involve all segments of the Newark school system to include its students, teachers and administrators. Additionally, Rutgers-Newark shares a partnership in a pre-college consortium with its CHEN associates. It is significant to note the Campus has been involved in pre-college activities for more than a decade providing services during this time that have benefited more than 10,000 students in the public school system of the City and beyond. Some of the main programs include:

- Central High's "Break the Mold Initiative" that provides support services to students and teachers to increase retention and graduation rates.
 - Central High School feeder school preparation services.
 - Chad School Partnership that enables minority students to enter science and technology-based and industrial sector professions.
 - The Howard Hughes Medical Institute, which attracts and retains students in the sciences, particularly among underrepresented minorities.
 - The National Center for Research Resources that works to increase the pool of underrepresented minority high school students in the biomedical and health professions.
- A variety of pre-college programs, offering basic skill building to hands-on laboratory experiences and individual mentorship, have been established at UMDNJ to help increase the number of minority student applicants to colleges and health professions universities. These programs help prepare students from Newark and surrounding communities to succeed in the elementary grades, high school and college by strengthening their academic and study skills, and by enhancing their interest in the biomedical sciences, health care, and other career options. Additional programs are offered that provide health related curriculum training to area teachers of grade school and high school students.
- The University has also established programs to enhance its recruitment and retention of minority students within its allied health, medical, and dental schools. A few examples of the programs on the UMDNJ Newark campus include:
 - The Hispanic Center of Excellence that offers a variety of youth programs.
 - Early Start Mentoring Program for 5-8 year-old minority children at risk for aggression.
 - The SMART Initiative that aims to enhance the interest and success of high school students traditionally underrepresented in the biomedical sciences and the teachers of these students.
 - Consortium for Pre-College Education Program. This program is a collaboration between UMDNJ, NJIT, Rutgers-Newark, and the East Orange, Irvington, and Newark public school districts that targets students in grades 7 through 12. In addition to its scientific focus, each program addresses academic skills, problem solving, career counseling, interpersonal communication, social commitment, and leadership.
- Throughout its existence ECC has sponsored various youth education programs. Current programs provide over 1,500 students each year with instruction ranging from reading, math and science enrichment to SAT preparation and computer programming. ECC's pre-college initiatives in the Newark area include:

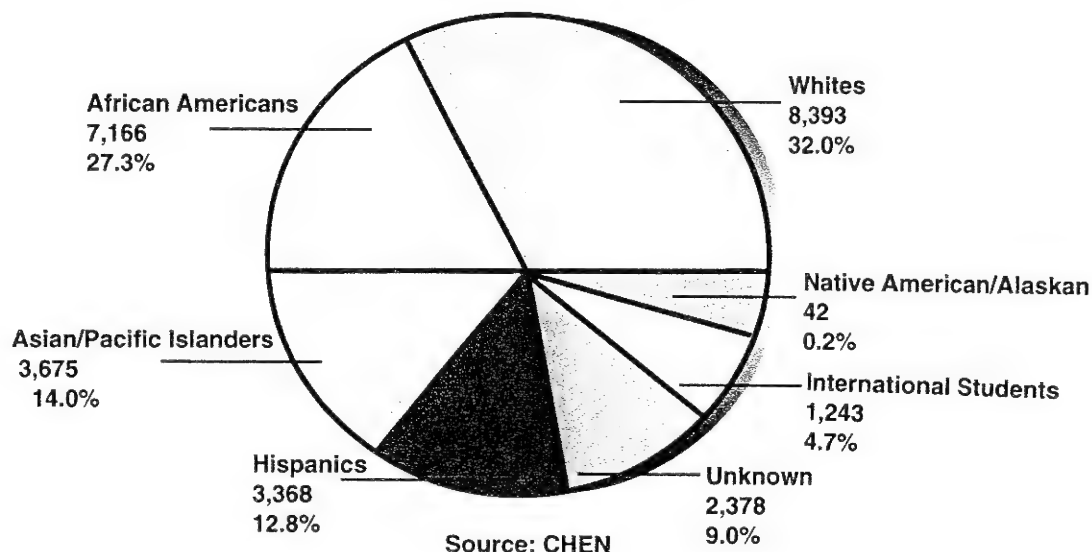
- Talent Search, a college preparatory program that provides counseling, tutoring, cultural activities and academic classes to 6th –12th graders and dropouts from Newark and Essex County schools. The program serves 1,200 students, ages 11-27 years annually.
- Outward Bound, a college preparatory program providing academic classes, tutoring, counseling, college placement, and personal development to Newark Public School students through participation in an array of social/cultural activities. The program serves 135 students, ages 13-19 years each year.
- College Bound Tech, a college preparatory program, that provides tutoring, counseling, college placement, personal development and academic classes with science, math/technology emphasis to Newark students through participation in an array of educational/cultural activities. The program serves 50 students, ages 14-19 years annually.
- Programs serving younger children including Making Math Matter, a six week program designed for 4th - 6th graders to stimulate fun while learning the mystery of math; and Reading Enrichment Program, a six-week program designed for 3rd - 4th graders to foster their reading comprehension and writing composition skills.
- GEAR-UP (Gaining Early Awareness and Readiness for Undergraduate Programs) is a new five-year \$4.4 million grant program from the US Department of Education designed to improve academic achievement for students in grades 7-12, and to increase the number of low-income students prepared to pursue postsecondary education.
- Agreements with area high schools, whereby seniors at selected schools, such as Science High School in Newark and Irvington High School, take college-level courses at Essex County College for credit. The success rate for such students has been outstanding, ensuring that these types of collaborations will expand and continue.
- A Mentoring Program, in which ECC faculty and students in accounting, business, English, history, mathematics, computer science and other disciplines tutor area high school students. In one such program, "Pizza and Problem Solving," participating teens meet with Essex student-mentors and faculty to review math problems in an informal atmosphere. Another program, "Reading and Pizza," similarly introduces area high school students to literature.
- Through the BRIDGES Program, Essex County College and Rutgers-Newark faculty present joint seminars for ECC students on a wide range of scientific and technical subjects.

Diversity and Ethnicity



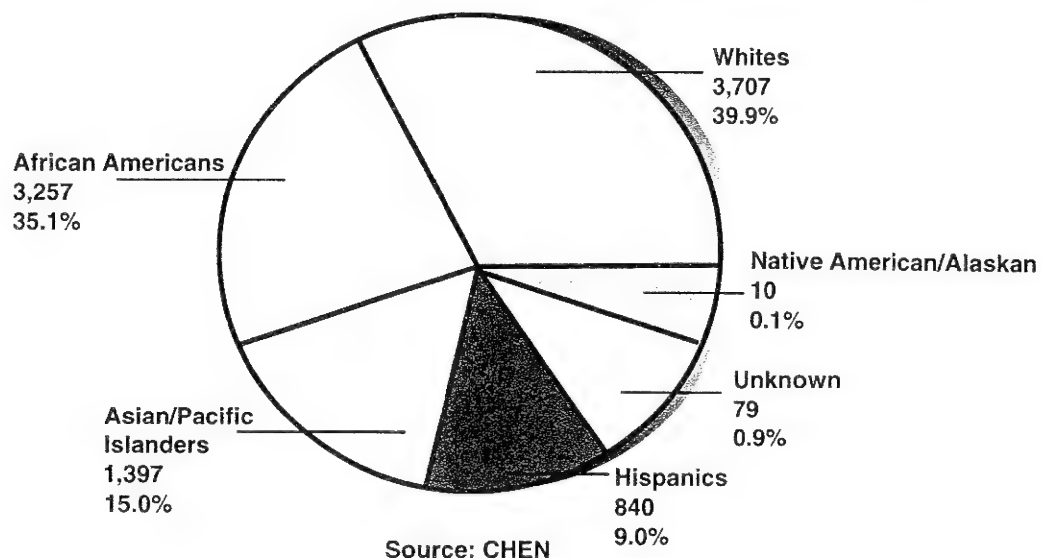
CHEN schools are highly proactive in reaching diversity goals for their students, faculty and staff. Student diversity at CHEN schools is high with one school ranking as having the most diverse student population among national universities. The majority of the CHEN students are from ethnic minority groups, with ECC having the highest concentration of ethnic minorities. The following chart shows the percent distribution of students by ethnicity:

Chart 10: Student Ethnicity at CHEN Schools in 1999



CHEN's labor force is also highly diverse. The majority of CHEN full-time employees, three out of five, are from ethnic minority groups. The following chart shows the percent distribution of full-time employees by ethnicity:

Chart 11: Full-time Employee Ethnicity at CHEN Schools



These achievements reflect strong policies in the area of diversity by the CHEN schools, which are implemented through a variety of programs and activities:

- UMDNJ has established a Diversity Team to review the progress made and to identify initiatives necessary to achieve diversity goals. Each school of the University has developed goals and criteria to meet the diversity goals. Strategies include programs to expand the applicant pools for underrepresented students and minority employees, identify and develop graduates for faculty opportunities, increase recruitment of minority faculty and staff at the administrative level, establish partnerships and linkages with organizations and professional associations that train and prepare minorities for employment, and increase participation of high school and undergraduate minority students in the academic preparation (pipeline) programs. In Academic Year 1999-2000, Black and Hispanic students comprised 18 percent of the University's total enrollment.
- Essex County College has a history of serving students from foreign countries. The college has approximately 450 foreign students from 90 countries. The two leading language groups are Spanish and French/Haitian Creole. The other 46 different language groups include Portuguese, Arabic, Russian, Gujarati, Swahili, Korean, and Polish. On a national level, as reported in *Community College Week*, Essex County College ranked 43 in the total number of minority Associates Degrees awarded in 1997-98. In the state of New Jersey, for FY 99, ECC ranked first in the number of minority Associate Degrees awarded.
- NJIT has numerous outreach programs aimed at diversity and is active in efforts to attract and maintain minorities. NJIT was ninth in the nation in the number of engineering and engineering technology bachelor's degrees conferred on Hispanic students (*Hispanic Outlook*), tenth in the nation in the conferral of baccalaureate degrees in engineering on African American students (*Black Issues in Higher Education*), and the only university in the nation listed in the top ten of both rankings.
- For the fourth consecutive year, U.S. News and World report has proclaimed the Newark Campus of Rutgers University as having the most diverse student population among the colleges and universities in the entire nation. The students enrolled on campus represent over seventy-five different countries around the world. The intense efforts to adequately accommodate this diverse student population can be evidenced in courses, programs and activities in many areas. Within the School of Law, the Minority Student Program, even after thirty years in existence, remains at the forefront of legal education in New Jersey and is a model program for the United States. In the College of Nursing, several multicultural courses exist and in the Newark College of Arts and Sciences, many of the departments offer courses and programs of diversity. Of recent note is the imminent inauguration of the Portuguese Studies Program, which will be supported by a lecture series provided by the Center for Global Change and Governance. The list continues with both a fully active administrative unit for international students as well as a plethora of programs and activities throughout the year provided by the Robeson Campus Center, which include diverse and multicultural themes.

Equal Opportunity Fund (EOF) Programs

EOF

The CHEN schools have some of the strongest EOF programs in the state. These programs, which have been in existence since 1968, have been responsible for the successful matriculation and graduation of thousands of students who would not have been able to access the benefits of higher education. For example:

- NJIT's *EOP Freshmen Engineering Research Seminars* introduced selected freshmen students to the myriad of professional opportunities and rigors of research in engineering through seminars covering 1) what electrical engineers do and where, 2) research methodology, 3) preparing for presentations at conferences. Through the *EOP Sophomore Community Service Program*, all sophomores were required to find an activity in the Newark-area community in which they could give back their expertise. In addition, the raw number of graduating seniors has risen each year.
- The EOF Program at the UMDNJ-School of Health Related Professions seeks to increase the number of disadvantaged/minority individuals enrolled in and graduated from undergraduate programs in the allied health professions. Students are also encouraged to return to their communities to practice. To accomplish these goals, the EOF program conducts an intensive summer pre-freshman program that assists students in strengthening their academic skills and in adjusting socially and psychologically to health professions and the clinical environment. It also conducts a comprehensive academic year program that enables students to participate in college survival skill seminars, tutoring, in professional courses, counseling, and monthly community meetings. Students also benefit from a series of employability workshops that help prepare prospective graduates to function as professionals in the world of work.
- ECC data show that EOF graduation rates have steadily improved from a low of 8.3% during the four-year period 1993-1997 to a high of 23.5% from the four-year period of 1995-1999.
- The Newark Campus of Rutgers has two of the top rated Educational Opportunity Fund Programs in the State. Each year, during the rating of the fifty-three programs throughout the State, Rutgers Newark's EOF programs at the College of Nursing and in the Faculty of Arts and Sciences lead the performance outcomes among all of the colleges and universities.

Business Support



Programs designed specifically to aid local businesses, as well as other ongoing activities of CHEN schools, provide an important support link for business development in the Newark area. CHEN's commitment to local economic development provides a true long-term anchor to the community as well as a dynamic resource for the support of business growth.

Incubators and Technical Assistance: Hands-on assistance is provided by CHEN organizations to small businesses and entrepreneurs in the local area. This includes start-up advice, provision of real estate space, financial advice, business loans facilitation, technical assistance, government procurement assistance and other support programs. Major initiatives, such as the launching of the University Heights Science Park, that involves both local business development and new business attraction, also reflect a major commitment by CHEN. In addition, through a variety of development efforts and joint studies, CHEN assists local and state government in the advancement of constructive policies and programs involving such areas as regional transportation, telecommunications, high-tech industries, manufacturing, culture and housing.

- NJIT provides valuable assistance to the New Jersey business community in obtaining government contacts. Through its Procurement Technical Assistance Center of NJIT's Office of Economic Development, the Center provides marketing, contractual, and technical assistance to small, women-owned and minority-owned New Jersey companies who are interested in selling their goods and services to the Department of Defense and other government agencies. Assistance is provided to business firms through the sponsorship of workshops and seminars, the implementation of government market research in the form of bid information opportunities, and one-on-one counseling on all aspects of government procurement.
- NJIT's Enterprise Development Centers (EDCs) accelerates the successful development of entrepreneurial companies through an array of business support resources and services, developed or orchestrated by EDC management, and offered both in the incubator and through its network of contacts. The EDC's main goal is to produce successful firms that will leave the program financially viable and freestanding. These incubator "graduates" create jobs, revitalize neighborhoods, commercialize critical new technologies and strengthen local and national economies. The incubator program also provides clients access to appropriate rental space and flexible leases, shared basic business services and equipment, technology support services, and assistance in obtaining the financing necessary to company growth. The EDC currently has 37 clients in a wide-range of business types. These include high-tech, clothing, communications, health technology, and child-care businesses. The Center's services are offered free of charge. Since 1985, New Jersey businesses received thousands of government prime and subcontract awards as a direct result of assistance provide by the Center.
- UMDNJ contributes to the general health of the state's number one industry – pharmaceuticals – through substantial collaborative interaction. The University is a partner in hundreds of clinical trials involving the evaluation of new drugs and treatments developed by nearly all of the state's pharmaceutical companies. In fiscal 2000, UMDNJ was awarded \$11.5 million in research contracts and grants from pharmaceutical companies and other corporate and private sources to conduct projects ranging from fundamental research to advanced clinical trials in areas such as cancer, cardiovascular disease, and diabetes.

Council for Higher Education in Newark
Economic Impact Report

- Faculty at UMDNJ are testing new devices and discussing the development of innovative product lines with several major New Jersey corporations. Examples of University/business collaboration include University faculty and students participating with Becton Dickinson representatives in testing new safety applications to their injection systems.
- The nation's largest suppliers of herbal remedies are located in New Jersey, including the largest extractor of natural botanicals in North America. A Center for the Study of Alternative and Complimentary Medicine was recently established on the UMDNJ Newark campus. The Center will provide a focus for the University to increase its research and educational activities on the safety and efficacy of various alternative and complimentary therapies.
- Key benefits of University research are the new products, treatments and services derived from discoveries made at UMDNJ. Since 1996, UMDNJ has received 49 patents and executed 25 research and licensing agreements, many directed toward the development of new drugs.
- BioDelivery Sciences Inc., launched in 1995, utilizes a platform of research developed by Drs. Raphael Mannino and Susan Gould-Fogerite at the UMDNJ-New Jersey Medical School. The company has developed novel methods for oral delivery of bimolecular substances – vaccines, insulin and other drug therapies, which normally do not survive the journey through the gastrointestinal tract.
- Rutgers is working with the NJSBDC to develop a Westside Business Hub in Newark. The project's goal is to establish job training, employment and entrepreneurial opportunities for local residents through the development of commercial corridors within the South, Central and West Wards of Newark. Key elements of the project include the establishment of a satellite SBDC on-site to provide management counseling and training services for aspiring and established business owners; a strip mall restoration and extension at 10th Avenue and Springfield Avenue; and construction of a new Island Building for retail and service business on Springfield Avenue.
- Rutgers SBDC is also playing a collaborative role in a Community Development Corporation formed by City National bank last year, called the Newark Stakeholders Collaboration Committee. The purpose of the Collaboration is to promote Economic Development in Newark, especially downtown Newark, and the immediate surrounding communities. The group meets monthly to exchange information, ideas and make referrals. City National Bank has set aside funds to lend to small businesses through the CDC. Rutgers SBDC will do the loan packaging and business plans for applicants. In addition to the activities above, Rutgers-Newark SBDC will be teaching a series of four business seminars for the Clinton Avenue Merchants Association. This is in conjunction with Public Service Electric Gas (PSEG)'s South Ward Project. The retail merchants along the street will get training in record keeping, business finance and two courses in contracts.

- The Rutgers University Technical Assistance Program to provides a wide variety of technical assistance to New Jersey businesses and non-profits. The assistance normally takes the form of strategic plans that assist businesses to achieve their objectives. In addition, the Interfunctional Team Consulting Program of the Graduate School of Management provides support to all types of businesses through the assignment of teams of graduate students for actual, "real time, hands-on" consulting.

Banking: CHEN institutions are heavy supporters of local banks and other financial institutions, utilizing their services for all types of transactions, including payrolls, depository accounts, electronic fund transfers, accounts receivable, investment services, custody accounts, trustee for bonds, letters of credit and many other services. CHEN transactions and investments at financial institutions with New Jersey operations are valued in the hundreds of millions of dollars and help expand the credit base available in New Jersey. Among these institutions are:

- Bank of New York
- Chase Manhattan Bank
- City National Bank
- First Union National Bank
- Fleet Bank
- Josephthal & Co., Inc.
- Merrill Lynch
- Paine Webber
- PNC Bank
- Summit Bank
- United National Bank
- Warner & Stackpole LLP

Student and Visitor Spending

Newark
New Jersey's
College Town

Local businesses also get major benefits from students spending on food, laundry, entertainment, gasoline and other out-of-pocket expenses. While tuition and some room-and-board expenses are already covered in the institutional spending of CHEN, the out-of-pocket expenses can add up to millions of additional dollars circulating in the local and state economy, and generating an additional multiplier effect to the benefit of local merchants, suppliers and workers.

CHEN schools attract numerous visitors to Newark each year to the benefit of local businesses and the community. These visitors include professionals and administrators who come to Newark to attend conferences and meetings, students' families, patients' families and others. These visitors spend millions of dollars each year on food, lodging and transportation in the Newark area, with other local businesses benefiting from the multiplier effect.

Alumni



Graduates of CHEN programs can be found in numerous organizations and corporations in the Newark area and throughout New Jersey. They make a significant contribution in fulfilling critical labor force needs in the area, with many alumni occupying senior policy and decision-making positions. For example:

- Rutgers alumni are well represented at senior levels of government policy-making, including the U.S. Senate and House of Representatives, federal cabinet, New Jersey Senate and Assembly and New Jersey governor's cabinet and the New Jersey Supreme Court. In the private sector, alumni hold top executive positions in insurance, pharmaceuticals, transportation, publishing, banking and communications.
- There are 11, 267 NJIT alumni on record employed in New Jersey primarily in the areas of telecommunications, pharmaceuticals, construction and transportation. Alumni presence ranges from 470 employed at Lucent Technologies, 124 at the NJ Department of Transportation, 110 at Telcordia Technologies, 100 at Merck and Co., 164 at Foster Wheeler Corp., and 80 at GPU Energy. In the city of Newark, alumni presence is notable at Verizon, New Jersey Transit, Prudential, PSE&G, NJ Department of Transportation and the NJ Board of Regulatory Commission.
- Essex County College alumni have become outstanding contributors to their communities. They include business people, teachers, attorneys, engineers, architects, health care professionals, social workers, and others. Thousands of ECC graduates who hold associate degrees in the applied disciplines – nursing and engineering technology and more – have succeeded in the marketplace right out of ECC. Thousands more have continued on into baccalaureate programs and beyond at four-year institutions in New Jersey and out-of-state.
- On the University's Newark campus the New Jersey Medical School has graduated over 5,000 physicians with approximately 35% currently practicing in New Jersey and serving the healthcare needs of the state in multiple settings ranging from private practice to research in academic and pharmaceutical settings. Nursing School alumnae are employed as either generalist or advanced practice nurses in a variety of New Jersey's health care facilities.
- As the state's sole resource for professional education and academic dental research, graduates of the New Jersey Dental School enter directly into private practice or gain admission to a residency or graduate specialty program prior to practice. Alumna of the Graduate School of Biomedical Sciences are playing key roles within academia and industry, and hold many key research and development positions within New Jersey's leading pharmaceutical and biotechnology industries. School of Public Health graduates are well represented in industry, state and local health departments, private and voluntary organizations. In addition, approximately 80% of the graduates of the UMDNJ-School of Health Related Professions are employed in New Jersey, representing \$154 million in annual earned salaries.

CONCLUSION

This economic impact report clearly demonstrates that the four institutions that make up the Council for Higher Education in Newark are critical contributors to the well being of the Newark area economy and make a significant contribution to the economy of the State of New Jersey. CHEN achieves this on two levels: it is a key player in providing large and measurable streams of dollars into the local and state economy; and, it is an active long-term partner in the economic development of its community.

The findings of this report show that CHEN has a multi-billion dollar impact on the state economy, affecting numerous sectors throughout the state and generating a substantial number of jobs, income and taxes, directly and through the ripple effect of its spending. CHEN's impact at the local level is even more intense as CHEN represents one of the largest employment bases in Essex County and the City of Newark. It is particularly significant that CHEN's spending, job and wage impacts are sustainable over time, both through its operating programs and through its major capital investments.

At the same time, the study demonstrates that CHEN, through its many educational services, health services, research, outreach programs and community activities, makes critical contributions to the life of community residents and to the overall economic development efforts in the Newark area. Moreover, CHEN's institutional presence and reputation, as well as the presence of its highly qualified alumni, help attract new investments and businesses to the City of Newark and its surrounding region.

As the City of Newark begins to show signs of economic growth and renewal following years of economic setbacks, CHEN will continue to play an important role as a major partner and an engine for future growth and development in Newark, its surrounding region and the entire state.